

This Page Is Inserted by IFW Operations  
and is not a part of the Official Record

## **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,  
please do not report the images to the  
Image Problems Mailbox.**



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 :  A01M 1/20, 1/24, 21/00, A01N 25/34, E01H 11/00, E04B 1/72, B32B 5/00, 33/00		A1	(11) International Publication Number: <b>WO 97/47190</b>  (43) International Publication Date: 18 December 1997 (18.12.97)
(21) International Application Number: PCT/IB97/00583  (22) International Filing Date: 22 May 1997 (22.05.97)		(74) Common Representative: AGREVO UK LIMITED; Sewell, R., C., Patent Dept., Chesterford Park, Saffron Walden, Essex CB10 1XL (GB).	
(30) Priority Data: PO 0372 11 June 1996 (11.06.96) AU		(81) Designated States: AU, BG, BR, CA, CN, IL, JP, KR, MX, SG, TR, US, VN, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).	
(71) Applicants (for all designated States except US): HOECHST SCHERING AGREVO PTY. LIMITED [AU/AU]; 1731- 1733 Malvern Road, Glen Iris, VIC 3146 (AU). AGREVO UK LIMITED [GB/GB]; Hauxton, Cambridge CB2 5HU (GB).		Published With international search report.	
(72) Inventors; and—  (75) Inventors/Applicants (for US only): MORROW, Philip, McLaughlin [AU/AU]; 9 Kelly Close, Baulkham Hills, NSW 2153 (AU). GLOVER, Andrew, John, Alexander [AU/AU]; 11 Havilah Avenue, Wahroonga, NSW 2076 (AU). FRASER, Gregory, Stuart [AU/AU]; 43 Catalpa Crescent, Turramurra, NSW 2074 (AU). FEEZ, Anthony, Mowbray [AU/AU]; 14 Bruckner Street, The Gap, QLD 4061 (AU). CRAMPTON, Peter, Leslie [GB/GB]; 18 Mulberry Close, Tring, Herts HP23 5DZ (GB).			
(54) Title: PESTICIDAL BARRIER			
(57) Abstract			
<p>The invention relates to a laminar pesticidal barrier (1) for covering the ground beneath a building or cultivated area comprising an upper portion (3) and a lower portion (4) each of which comprises a layer substantially impermeable to pesticide, and a foraminous pesticide-containing layer (2) between said portions.</p>			

Pesticidal BarrierTechnical Field

5 The invention relates to pesticidal barriers and particularly to dual-purpose pesticidal-moisture barriers for use in the construction industry for protecting building foundations from subterranean attack from pests and moisture, particularly termites. However the invention is not intended to be limited to the construction industry, but also finds utility in any situation where the entry of

10 pests need preventing across a large area, for example cultivated areas in agriculture and horticulture. In addition, the invention is not intended to be limited to termites, but forms an effective barrier to other pests such as weeds, fungi, insects and the like, when used in conjunction with a suitable pesticide.

15 Background Art

In many countries of the world, particularly in tropical and sub-tropical regions, buildings are susceptible to attack from subterranean pests, especially termites. In such countries it is prudent to take preventative action to prevent pests entering buildings. Such preventative action involves creating a barrier, typically a

20 pesticidal barrier, to prevent access of the pest.

It is both more convenient and more effective if such a barrier is created prior to construction such that it covers the area underneath the building including its footings. For a number of years it has been commonplace to create pesticidal

25 barriers by spraying high doses of toxic and/or persistent pesticides, particularly organophosphate and organochlorine compounds directly into the ground beneath the building prior to construction. However, this practice results in environmental contamination, food chain entry and bio-accumulation, and its practice is forbidden in a number of countries.

30

A number of attempts have been made to reduce the environmental damage caused by the above-mentioned pesticidal barriers. For example, WO 90/14004 (Sapsford) describes a method of creating a pesticidal barrier prior to building construction which comprises lining a building excavation with a fibrous blanket

termites, and therefore rather than deterring pests away from the barrier may actually attract them.

A further problem with all of the abovementioned pesticidal barriers is the  
5 requirement to use protective clothing to limit exposure of the construction worker  
to the pesticide, when laying a pre-impregnated blanket or when spraying.

We have now developed a simple yet ingenious invention which in addition to  
addressing the above mentioned problems, also provides a more effective barrier  
10 to termites.

#### Disclosure of Invention

According to an aspect of the invention there is provided a laminar pesticidal  
barrier for covering the ground beneath a building or cultivated area comprising, an  
15 upper portion and a lower portion each of which comprises a layer substantially  
impermeable to pesticide, and a pesticide-containing layer between said portions,  
characterised in that the pesticide-containing layer is foraminous.

It will be appreciated that the invention functions as an effective pesticidal barrier  
20 in any orientation. For example the barrier can be situated vertically to prevent  
pest ingress from the side or lain horizontally to prevent pest ingress from  
beneath. Typically however the barrier will be used to completely line an  
excavation, such as a trench. In this instance the barrier prevents pest ingress  
from beneath and from the side. For the purposes of conciseness therefore the  
25 term "upper portion" refers to the portion of the blanket between the pesticide-  
containing layer and the building footings, and the term "lower portion" refers to  
the portion of the barrier between the pesticide-containing layer and the ground.

We have found that pesticidal barriers made in accordance with the invention  
30 provide a number of advantages over prior art pesticidal barriers.

In the unlikely event that pests breach the lower portion of the barrier, the  
foraminous nature of the pesticide-containing layer will prevent progress of other  
pests across the barrier. During tests we have discovered that pests, particularly

may attract other pests, such as termites. We have found that our invention also performs as an effective moisture barrier. Thus, in a preferred embodiment at least one of the upper or lower portions is impermeable to moisture.

- 5 As mentioned above, our invention finds particular utility in the construction industry because of its dual role as a pesticide / moisture barrier. The barrier is typically lain underneath a building prior to the laying of the concrete foundations which are built directly on top of the barrier. Accordingly it is important that the upper portion of the barrier is sufficiently robust to withstand the construction of
- 10 the building foundations. Therefore, in a preferred embodiment the upper portion of the barrier is more resistant to rupture than the lower portion. In a preferred example, resistance to rupture of the upper portion may be achieved by increasing its thickness relative to the lower portion. Preferably the upper portion is between 150 and 250 microns thick and the lower portion is between 75 and 125 microns
- 15 thick.

We have found it convenient for both upper and lower portions each to consist of a single layer which combines the above mentioned properties of being impermeable to pesticide, and/or moisture, and/or resistant to rupture. Therefore

- 20 in a preferred embodiment the upper and lower portions are polyethylene.

Plastic materials such as polyethylene are known to degrade when exposed to sunlight which may be a problem when pesticidal barriers according to the invention are stored outdoors for significant periods. Therefore we have found it

- 25 advantageous to provide at least one of the upper or lower polyethylene portions with a UV stabiliser.

The term **foraminous** when applied to the **foraminous layer** is intended to include any material which contains passageways. Examples of suitable **foraminous layers** are woven materials, sponges and foams. Preferably the **foraminous material** is a fibrous mat wherein the fibres are from 4 to 8 denier and the fibre crossing points are 100 microns apart, and wherein the average void volume of the mat is 85% at 10 kPa.

containing-layer of our invention to prevent fungal growth therein, thereby reducing the likelihood that termites will be attracted to the barrier. Particularly effective fungicides include the azole group of fungicides, such as prochloraz, cyproconazole, propiconazole, tebuconazole, azaconazole or carbendazim.

5

As mentioned above the pesticidal barrier is not limited solely to use as an insecticide or termiticide barrier. For example, when the pesticide-containing layer contains a herbicide, weeds will be prevented from passing through the barrier. Such a herbicidal barrier finds utility in the production of turf, when lain beneath 10 turf the barrier will prevent weeds passing through the barrier and contaminating the turf. In similar fashion, the invention finds utility as a barrier to fungi and moulds when the pesticide-containing layer contains a fungicide. Particularly effective fungicides include the azole group of fungicides, such as prochloraz, cyproconazole, propiconazole, tebuconazole, azaconazole or carbendazim.

15

The invention is also directed to methods for installing and manufacturing the pesticidal barrier. Such methods would be readily apparent to a skilled person.

Brief Description of Drawing

20 The invention will now be described by way of example only with reference to the following figures.

Figure 1 shows a side-sectional view of a laminar pesticidal barrier in position prior to laying foundations for a building.

25

Referring to Figure 1 there is shown a laminar pesticidal barrier 1. Barrier 1 comprises a pesticide-containing layer 2 and upper and lower portions 3 and 4 respectively. The edges of barrier 1 show both upper and lower portions extending beyond pesticide-containing layer 2 (layers 3 and 4 are depicted separated at the 30 right hand edge of the barrier to enhance clarity). Pesticide-containing layer 1 is preferably a mat of fibre. Preferred fibres are synthetic such as nylon, polypropylene and titanium dioxide.

CLAIMS

- 1 A laminar pesticidal barrier (1) for covering the ground beneath a building or cultivated area comprising, an upper portion (3) and a lower portion (4) each of which comprises a layer substantially impermeable to pesticide, and a pesticide-containing layer (2) between said portions, characterised in that the pesticide-containing layer is foraminous.
- 2 A laminar pesticidal barrier according to claim 1 wherein the foraminous pesticide-containing layer (2) is flexible.
- 3 A laminar pesticidal barrier according to any preceding claim wherein the foraminous pesticide-containing layer (2) comprises synthetic material.
- 15 4 A laminar pesticidal barrier according to any preceding claim wherein at least one of the upper and lower portions (3 or 4) is impermeable to moisture.
- 5 A laminar pesticidal barrier according to any preceding claim wherein the 20 upper portion (3) is more resistant to rupture than the lower portion (4).
- 6 A laminar pesticidal barrier according to any preceding claim wherein the upper portion (3) is between 150 and 250 microns thick and the lower portion (4) is between 75 and 125 microns thick.
- 25 7 A laminar pesticidal barrier according to any preceding claim wherein the upper and lower portions (3 and 4) are fabricated from polyethylene.
- 8 A laminar pesticidal barrier according to claim 7 wherein at least one of the 30 polyethylene portions (3 or 4) contains a UV stabiliser.
- 9 A laminar pesticidal barrier according to any preceding claim wherein the pesticide-containing layer (2) is a fibrous mat.

21 A laminar pesticidal barrier including an inner layer (2) formed from a material that is capable of holding a pesticide and upper (3) and lower (4) outer layers that are arranged and adapted to prevent contact with the inner layer (2) wherein the inner layer is a woven, foraminous and fibrous mat.

5

## INTERNATIONAL SEARCH REPORT

International Application No.  
PCT/IB 97/00583

## A. CLASSIFICATION OF SUBJECT MATTER

Int Cl<sup>6</sup>: A01M 1/20, 1/24, 21/00; A01N 25/34; E01H 11/00; E04B 1/72, B32B 5/00, 33/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC<sup>6</sup>: A01M 1/20, 1/24, 21/00; A01N 25/34; E01H 11/00; E04B 1/72; B32B 5/00, 33/00Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
AU: IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	AU 62329/90 A (TRIM) 14 March 1991. See page 5 line 10 to page 6 line 30	1, 21
X	AU 32834/93 (662035) B (CASA BERNARDO LTDA) 18 August 1994 See figure 2	1, 21
Y	GB 2098541 A (CALIGEN FOAM) 24 November 1982	1
X	See claims 8, 21 and 38	21

 Further documents are listed in the continuation of Box C See patent family annex

• Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier document but published on or after the international filing date	"X" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

20 June 1997

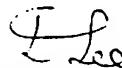
Date of mailing of the international search report

24 JUN 1997

Name and mailing address of the ISA/AU  
AUSTRALIAN INDUSTRIAL PROPERTY ORGANISATION  
PO BOX 200  
WODEN ACT 2606  
AUSTRALIA Facsimile No.: (06) 285 3929

Authorized officer

DAVID LEE



Telephone No.: (06) 283 2107

## INTERNATIONAL SEARCH REPORT

#### Information on patent family members

International Application No.  
**PCT/IB 97/00583**

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member						
GB	2098541	NONE						
WO	90/14004	AU	56607/90					
AU	52454/96	NONE						
AU	48655/90	NONE						
JP	01-058739	NONE						
US	4929497	CAT	93573	AU	49287/90	BR	9000817	
		CA	2012353	EP	390428	ES	2043272	
		JP	03-047391					
US	4666767	AR	198257	AT	9340/73	AU	61087/73	
		BE	807146	B4	7308751	CA	1025770	
		DE	2356155	ES	419946	FR	2206051	
		GB	1391248	IL	43309	IN	140712	
		IT	999741	JP	49-079859	JP	58-032944	
		NL	7315293	TR	18172	ZA	7307999	
		US	4160335	US	4639393			
WO	95/18532	AU	13886/95	CN	1142745	EP	738108	
		FR	2714685					
AU	82443/01	NONE						
AU	16163/95	NONE						